American scientists as public citizens: 70 years of the Bulletin of the Atomic Scientists

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American Scientists as Public Citizens:

Seventy Years of the Bulletin of the Atomic Scientists*

David Kaiser (MIT) and Benjamin Wilson (Stanford)

It has been seventy years since a group calling itself the “Atomic Scientists of Chicago” issued its first dispatch. At the start, the group consisted of a handful of veterans of the Manhattan Project, concentrated at the Metallurgical Laboratory at the University of Chicago. Thoroughly engaged with the world around them, deeply worried about the implications of their work creating the first nuclear weapons, horrified by the destruction and death the bombs had delivered to Japan, they felt an obligation to act, and to say something.

The goals of their new organization and their new journal were, as the first issue of the Bulletin of the Atomic Scientists of Chicago put it in December of 1945, twofold: “To explore, clarify and formulate the opinion and responsibilities of scientists [concerning] the problems brought about by the release of nuclear energy,” and “To educate the public to a full understanding of the scientific, technological and social problems arising from the release of nuclear energy.” In October that year, at a meeting between the Chicago scientists and three like-minded groups from other Manhattan Project sites — Los Alamos, Oak Ridge, and New York City — the delegates had agreed to combine their efforts in a united organization, the Federation of Atomic Scientists.1

Mixing science and politics is risky business, we typically think. But as the early atomic scientists knew, to pretend that truth and power can live apart is to misunderstand each. The FAS was an organization of scientists dedicated to politics, and a political organization dedicated to the freedom and openness of science. These scientists were no fuzzy-minded thinkers and lab-

* © 2014, David Kaiser and Benjamin Wilson. To appear in Bulletin of the Atomic Scientists
bench tinkerers, innocent of the harsh realities of power and policy. Far from it. They set up their shop close to the heart of the action. At the birth of the FAS, it was agreed that the central office should be located in Washington, DC, and that at least one member from each of the four member associations should be present in the capital at any given time. The FAS central office was to function as “an information and speakers’ bureau” and would “handle contacts with legislative leaders.”

Struggle and controversy lay ahead. Bitter disagreement soon developed over what should be done with America’s temporary monopoly on the power of the atom. A new Congressional committee had recently been formed to weigh precisely this issue. The physicist Edward Teller, writing in the Bulletin in early 1946, gave cautious support to his colleagues’ hope of eliminating atomic weapons for good. But in another article the following year he described his belief “that if we should give way to fear and if we should fail to explore the limits of human power we shall surely be lost.” For him (and for a growing fraction of the Washington leadership), the limits of human power were realized in an expanding arsenal of nuclear weapons, the only good insurance policy against the rising threat of the Soviet Union. For most of Teller’s fellow contributors to the first issues of the Bulletin, however, such limits were explored at America’s peril, and the world’s.

The magazine’s title dropped the reference to its Chicago birthplace and became the Bulletin of the Atomic Scientists in March of 1946. In those days, a single copy cost ten cents. Its founding editors were the Austrian-born physicist Hyman Goldsmith and the Russian-born chemist Eugene Rabinowitch, each a veteran of the Chicago Met Lab. The Bulletin’s day-to-day operations owed much to the Chicago chapter’s 22-year-old secretary, Ruth Adams, who would work her way up through the editorial ranks in the years ahead. A specially designed cover first
appeared in June 1947. That iconic quarter-clock, its hands set at about seven minutes to midnight, began appearing monthly against a shifting palette of background colors. A couple years later the position of the minute hand had become sensitive to the state of the nuclear world. It moved ahead a few minutes in October 1949, following the announcement of the first Soviet nuclear test.  

Through endless changes there have been constants. The aim of the atomic scientists and their journal had always been dual, at once looking out to the world while focusing inward on developments at home. In 1945 there was the great question of international control: whether each nation, separately and secretly, would harness the atom, or whether nuclear technologies and materials would rest under the control of an international organization. And there was the recognition (as the Atomic Scientists of Los Alamos worded it in a newsletter from 1945) that “the preservation of…secrecy on a purely national basis would represent the defeat of any adequate program of international control.” Without responsible domestic civilian management and the free exchange of nuclear research and information, the atomic scientists believed, there was no hope for progress and peace at the international level.

Contributors to the Bulletin have expressed their responsibility as scientists not by ignoring or denying the political dimensions of science, but by comprehending and wrestling with them. Their struggles have not been easy or uncomplicated. As suggested by careful historical scholarship on scientists in the nuclear age, along with a sampling of articles published in the Bulletin since the Cold War’s dawn, the atomic scientists experienced a mix of success and failure, commitment and compromise, advance and retreat. But the main thing is that they were talking. Some of the most important and urgent conversations about the science and politics of the nuclear age have taken place in these pages. “Some among the friends of the Bulletin have
counseled it to quit, and to leave mankind to its folly,” wrote the longtime editor Eugene Rabinowitch in 1952. We can be grateful that he and his fellow editors and writers ignored the advice.

Controlling the Atom — and the Scientists

The earliest issues of the Bulletin were devoted to the challenges and opportunities of converting the wartime Manhattan Engineer District to a postwar setting. Many articles focused on competing bills that had been introduced in Congress soon after the end of the war: the May-Johnson bill would have extended military control over the nuclear weapons complex in the US, while the McMahan bill called for civilian control. The question of international control became similarly polarized. The Acheson-Lilienthal plan, released by the US State Department in March 1946, aimed to head off an arms race by establishing a new, international Atomic Development Authority, which would own and distribute fissile materials. While negotiating in the United Nations on behalf of the Truman administration, however, Bernard Baruch introduced several important changes, each aimed to punish other nations (especially the Soviet Union) for any efforts toward nuclear proliferation and thereby perpetuate the US monopoly.

On the matter of how to “control the atom,” readers of the Bulletin watched the fledgling atomic scientists’ movement pull to a draw. Congress passed the McMahon bill in July 1946, creating a new civilian Atomic Energy Commission, but only after significant changes had been added: virtually all information related to nuclear weapons would be “born secret,” and the civilian commissioners would need to work closely with a Military Liaison Committee.
Meanwhile, Baruch’s proposals for international control gained little traction in the United Nations, leaving no clear framework in which to address nuclear matters between nations.9

Physicist and Manhattan Project veteran Edward Condon had published spirited appeals on these matters in the Bulletin.10 Soon he became the subject of the news, not just a commentator. The House Committee on Un-American Activities repeatedly sniped at Condon for alleged disloyalty, even declaring in a March 1948 report that Condon was “one of the weakest links in our atomic security.”11 Though nuclear scientists and engineers had worked under close scrutiny and surveillance since the earliest days of the Manhattan Project, the public campaign against Condon galvanized the FAS.12 Soon the Bulletin was filled with updates and editorials denouncing the excesses of domestic anticommunism and debating the fast-growing federal apparatus of loyalty checks and security clearances.13

The Specter of “Atomic Secrets”

The legislative maneuverings around the McMahon bill and the wild charges against Condon unfolded amid shocking revelations about the theft of “atomic secrets.” In February 1946, a clerk working in the Soviet embassy in Ottawa defected, leaking information about a wartime spy ring that had included Manhattan Project scientist Alan Nunn May, among others. Four years later, Klaus Fuchs confessed that he, too, had passed information to the Soviets from his own Manhattan Project perch. Throughout the postwar decade, the House Committee on Un-American Activities and other Congressional committees kept the threat of further “atomic espionage” in the headlines.14
From the start, outspoken members of the FAS argued that much of what were branded as “atomic secrets” were no such thing. Important information about nuclear reactions was already widely known throughout the scientific community, or could likely be gleaned in any well-stocked laboratory; facets of nature, they argued, rarely stayed secret for long. More important, many emphasized, bombs were not built from formulas that could be hastily scribbled or hidden in the heel of a shoe: the real force behind the Manhattan Project had been industrial might rather than esoteric equations. Thus, early voices like Eugene Rabinowitch repeated, any efforts to clamp down too hard on the circulation of scientific information would only hamper legitimate research.\(^\text{15}\)

The early arguments had been vigorous, but concerted hectoring and red-baiting took their toll. As tensions with the Soviet Union escalated — even before the detonation of the first Soviet nuclear bomb in autumn 1949 — the Bulletin chronicled American scientists’ new realities. Access to federal research contracts, national laboratories, and even graduate-student fellowships required intrusive background checks and loyalty oaths. Outspoken scientists routinely had their passport applications denied, while foreign colleagues failed to secure visas to visit the United States, all with dubious protections for due process or civil liberties.\(^\text{16}\) Organizations and not just individuals felt the pressure. As historian Jessica Wang has chronicled, after years of hounding from Congressional committees and the FBI, groups like the FAS abandoned their more energetic political activities, settling instead for a kind of “quiet diplomacy.”\(^\text{17}\)

\textit{Banning Nuclear Tests}
As the nuclear arms race plowed ahead, scientists were drawn into the political arena once again over the issue of nuclear testing. In March 1954 the Castle Bravo thermonuclear test — the largest US nuclear detonation ever — rained radioactive fallout on several Pacific atolls, along with the Japanese fishing boat Lucky Dragon. As details of the test and its aftermath came to light (nearly two-dozen fishermen suffered symptoms of radiation sickness, and one eventually died) the event sparked international outrage against the hazards of nuclear testing. The Bulletin’s pages quickly featured articles explaining the effects of fallout on the human body; an entire special issue of the magazine in November 1955 was dedicated to the genetic effects of radiation. The voices of anti-testing alarmists like the chemist Linus Pauling could be heard above the din of reassuring government statements.  

Yet the same pressures that had intensified government suspicions of scientists and their “secrets” had also drawn increasingly rigid limits around what could be argued in public about US nuclear policy. The AEC investigation of Robert Oppenheimer, the “father” of the bomb himself, counseled caution to would-be commentators on the issue of nuclear testing. For recommending against a crash program in pursuit of thermonuclear weapons in 1949, Oppenheimer was punished in 1954 with a humiliating loyalty-security hearing, culminating in the loss of his clearance to access classified nuclear information.  

On one hand scientists increasingly confined the emerging test ban debate to “technical” issues — the means of verifying compliance with a possible treaty, the threshold yield above which underground explosions could be unambiguously detected, and so on. David Inglis, a physicist at the Argonne National Laboratory, optimistically told Bulletin readers in 1954 that a test ban could be verified by an international agency “so as to guarantee that any violation would be unequivocally announced to the world.” A technically verified test ban seemed the most
plausible first step in the much longer and more difficult process of disarmament. At the same time, concerned scientists acclimated themselves to the orthodoxy of nuclear deterrence. By 1957 Inglis could express his displeasure that during the 1956 Presidential election campaign (when Adlai Stevenson ran, and lost, on a platform including a call for a test ban) more attention had been given to the radiological hazards of testing than to what he saw as the more serious danger — the threat posed to deterrence by continued testing. As the physicist Hans Bethe recommended, ambivalently, “We should test those designs which fit into our strategic plans in order to be sure that we can rely on our designs and thus on our invulnerable deterrent.” Meanwhile influential pro-testing experts, especially Edward Teller, argued forcefully that a test ban was sure to give the Soviets a decisive nuclear advantage (and they were sure to cheat, in any case, Teller seemed certain).21

The scientists’ discussions in the Bulletin tracked the agonizing negotiations in Geneva, which began in 1959. A moratorium on nuclear testing had commenced in 1958 but ended dispiritingly in 1961 when the Soviets began a series of high-yield nuclear tests, including the largest-ever thermonuclear explosion. The US resumed its own testing just days later. This major setback spurred renewed interest in the test ban, and new efforts at the negotiating table. Bulletin editorial staffer Ruth Adams wrote to the MIT physicist Bernard Feld in the days following the broken moratorium, “Our mail has tripled from readers seeking advice and what they call nonpartisan facts” concerning the test ban. The journal’s writers — including Feld himself — were ready to provide them.22 Still, with such intense focus on the technical aspects of verification, in the end the scientists and the negotiators would not stop the arms race, but drive it underground. In August 1963, the Limited Test Ban Treaty prohibiting nuclear tests in the atmosphere, the oceans, and outer space was signed in Moscow. A comprehensive test ban
agreement would wait for another three decades, as the superpowers continued to build their arsenals with the aid of belowground tests.  

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**The Dream of Missile Defense**

Since 1945 the atomic scientists had said that there was no effective defense against nuclear weapons. The arrival of the missile age in the late 1950s put a point on this venerable claim. Missiles magnified the speed of nuclear delivery, shrinking the time-span between warning and arrival of a nuclear strike from hours to minutes. Some officials and Defense Department scientists, however, clung tenaciously to the idea that missiles might be defended against. By the mid-1960s, a spirited debate had started to take shape in the *Bulletin*.

The physicist Freeman Dyson argued in 1964 that development of missile defense systems had “reached the point at which serious decisions have to be made. It is not enough to repeat the slogan ‘there is no defense’ and leave it at that.” As Dyson would argue frequently in the years ahead, a nuclear world dominated by defense (by missiles designed to destroy other missiles, rather than cities) was surely the lesser of two evils. The mathematician and strategic analyst Jeremy J. Stone put forward a very different view later in 1964. In his eyes, an ABM deployment would amount to “a new round in the arms race.” Stone and many of his fellow arms controllers argued that because buying more offensive missiles was a cost-effective way of offsetting an adversary’s defenses, ABM did not dampen the arms race but *inflamed* it. The lines of dispute had been drawn, and over the next several years contributors debated the compatibility of deterrence and defense in the missile age.
During the 1960s scientists increasingly attacked ABM’s technical limitations, framing their arguments with the tools of their disciplinary expertise.\(^{27}\) In September 1967, Defense Secretary Robert McNamara announced the administration’s plan to deploy a “thin” ABM system (to shield against a “light” ICBM attack by China).\(^{28}\) Soon highly placed physicists were arguing on basic physical grounds that missile defense could easily be defeated. The physicists Hans Bethe and Richard Garwin went public with a blockbuster critique of ABM in a 1968 *Scientific American* article, explaining in impressive technical detail the various ways an attacker could deceive and overwhelm a missile defense system.\(^{29}\)

By the late 1960s arms controllers like Bethe were ferrying information and arguments from classified contexts—in which many scientists worked as consultants and advisors to the government—out into a growing public debate about nuclear policy. Scientists had earlier chafed against the restraints of government secrecy, but the arms controllers relied heavily on their insider status and their access to secret information in fashioning critiques of government programs. In fact as early as 1962 Bethe had offered, in the *Bulletin*, his judgment that effective missile defense was technically “impossible.” But at that early date the case was not easily made in public, “largely because much of the argument is classified,” he wrote. Thanks to his and others’ efforts, vigorous discussion of missile defense would become far more open by the end of the decade.\(^{30}\)

The destabilizing potential of missile defense was recognized in the landmark US-Soviet ABM Treaty in 1972, which put firm limits on allowed ABM deployments. But in the 1980s, the Reagan administration’s ambitious Strategic Defense Initiative (SDI) threatened the arms control orthodoxy. Government officials and their scientific backers revived the dream of perfect missile defense with promises of space-based “directed energy weapons” and other super-high-tech
platforms. Opponents attacked SDI with equal vigor, arguing (in the spirit of Bethe and Garwin) that SDI made technical promises it could never keep in a real nuclear war. SDI ultimately died a slow death. Missile defense, however, would long outlive the end of the Cold War — the George W. Bush administration withdrew the United States from the ABM Treaty in 2002 — and it remains a live issue for nuclear security analysts today.31

**The Challenge of Climate Change**

The polarizing Cold War — which had come to define so many facets of daily life for American scientists and policymakers — ended with an abruptness that caught most experts by surprise.32 The dissolution of the Soviet Union did not, of course, solve the dilemmas of nuclear weapons: securing fissile materials and weapons know-how continues to demand urgent attention, amid concerns about proliferation to unfriendly nations and non-state actors alike.33 Meanwhile, charges against Los Alamos scientist Wen Ho Lee in 1999 for mishandling nuclear secrets — which resulted in Lee’s spending nine months in solitary confinement before ultimately being exonerated of nearly all charges — seemed to echo earlier patterns of overreach and fear-mongering in the service of protecting the US nuclear stockpile.34

Nuclear concerns also served as a bridge to a new topic that began to fill the *Bulletin’s* pages in the early 1990s: climate change. Proponents and critics of civilian nuclear power recast their debate amid new apprehension about greenhouse gas emissions and implications for global warming.35 Soon the topic commanded space in the *Bulletin* even beyond the nuclear question. Detailed descriptions of scientists’ developing understanding of the risks of climate change ran side-by-side with heated denials that global warming posed any threat at all — early exchanges,
lobbed more than twenty years ago, that presaged today’s bitter, grinding stalemate on climate change.36

Since that time, most scientists and readers of the Bulletin have come to agree that global climate change poses an existential threat to humankind just as potent as a runaway nuclear arms race. Yet that very real concern has failed to drive effective political action. Despite a welter of reports by groups like the Federation of American Scientists and the Union of Concerned Scientists, no new “scientists’ movement” has coalesced with the same barnstorming zeal that had marked the early postwar quest to control the atom.

Perhaps scientists find it more difficult to rally public opinion today given the incremental nature of climate change. Even the most dramatic, photo-ready effects of global warming — titanic ice shelves cleaving off of glaciers in Antarctica — seem to lack the iconic force of a mushroom cloud hovering above a smoldering city. Meanwhile, decades of contentious struggle over topics like arms control may well have dampened younger scientists’ enthusiasm for the rough-and-tumble of direct political action.

Or perhaps the stubborn challenges of addressing climate change ultimately point to a broader lesson about scientists’ shifting political and cultural fortunes. After all, the flip side of red-baiting during the early Cold War was a widely-held assumption — whether merited or not — that scientists did deserve special attention. The scrutiny and surveillance came as a byproduct of the belief, shared by political officials, journalists, and the voting public alike, that scientists’ opinions and advice should carry extra weight in the nuclear age. Since the end of the Cold War, scientists’ place in the polity seems to have settled into a new reality: just another interest group jockeying for attention in a media-saturated world.
Knowledge and power, science and politics: we are no closer to solving the riddle of their entwining today than were those weary, earnest veterans of the Manhattan Project seventy years ago when they launched the Bulletin of the Atomic Scientists. The earthly challenges remain real; the stakes are still high. Amid today’s haze of Facebook “likes” and blog-addled misdirection, may the Bulletin long continue to serve as a vital forum for informed and impassioned ideas.

Notes


32 Hugh Gusterson, “Missing the end of the Cold War in security studies,” in Gusterson, People of the Bomb: Portraits of America’s Nuclear Complex (Minneapolis: University of Minnesota Press, 2004), 100-120.


